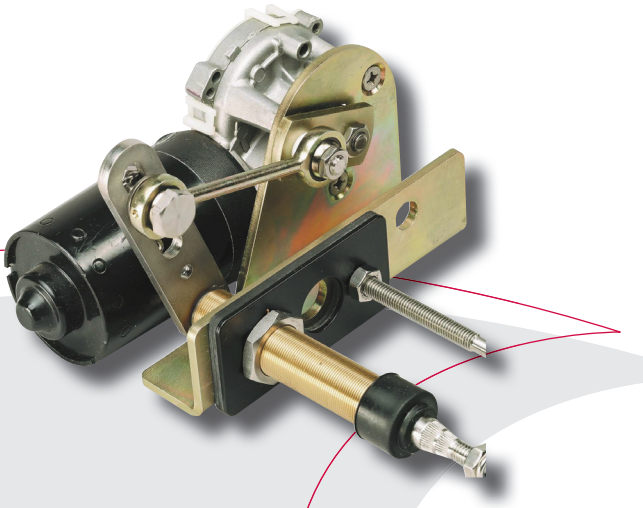
Exalto

Parts • **Wipers** • Bearings • Propulsion

User manual for
Exalto windshield wiper
Type 223 BS 12/24 Volt



Cat. no. 2167.30/35 (12 Volt)
Cat. no. 2168.30/35 (24 Volt)

version 9 - 2012

Safety

Exalto windshield wipers are easy to install yet a fair amount of technical knowledge (mechanical and electrical) is required of the installer. Please consult the manual or contact your vendor in case of doubt during installation or malfunctioning.

Safety symbols

! An exclamation mark in front of the text warns you, that injury or damage can occur if a procedure is badly performed.

Dangers

The installation and use of Exalto wipers will not inflict any personal dangers or damage, provided that installation is done according to the procedures specified in the manual.

- Never remove covers or other safety provisions, unless maintenance is being performed and all safety requirements are obeyed.
- The installer must provide all necessary covers.
- ! Always disconnect the electrical circuit when performing maintenance. Prevent the installation from being started (accidentally) by others.

Safety provisions

The safety provisions will protect the user against contact with moving, electrical or hot parts. Some of them have to be provided by the installer. There are several safety provisions:

- ! Cover or panel (obligatory): covers moving parts and electrical connections. The installer MUST provide a self-made cover or place the wiper behind a panel.
- Make sure the wiper has enough ventilation when placing it behind a panel or cover.
- Place a fuse (see specifications) in the main cable.

Safety requirements

Before the Exalto wiper is installed, we strongly recommend the following:

- Read the entire manual before installation.
- Make sure your working environment as well as the wiper parts are clean.
- Check to be sure no parts are missing or damaged.
- Use only high quality tools and have them within reach when installing.
- Handle the parts with care.
- Never install or maintain the wiper with the electrical voltage applied, unless this is specifically mentioned in the manual.
- Clear your tools after installation.

Use of the manual

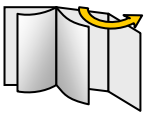
Read the entire manual before installation. In this manual you can find the following expressions and symbols:

Hint!
Gives you advice on how to perform a task more easily.

Attention!
Alerts you to possible problems and safety warnings.

Careful!
Warns if the product can be damaged when working carelessly.

Warning!
You can hurt yourself or damage the product severely.



At back of manual
Look at the back of the manual for a drawing.

Contents

1 Introduction 4
1.1 Introduction 4
1.2 Environmental factors 4

2 Technical data 5
2.1 General 5
2.2 Electrical data 12 Volt 5
2.3 Electrical data 24 Volt 5
2.4 Mechanical data 5

3 Installation 6
3.1 Preparation 6
3.2 Installation of mechanical parts 6
3.3 Electrical installation 8
3.4 Final installation 8

4 Operation and use 10
4.1 Preparation for first use 10
4.2 Use 10

5 Maintenance 11
5.1 General maintenance 11
5.2 Servicing 11
5.3 Changing the wipe arc and park position 11
5.4 Rough determination of wipe arc and wiper blade 11
5.5 Disassembly and assembly 13

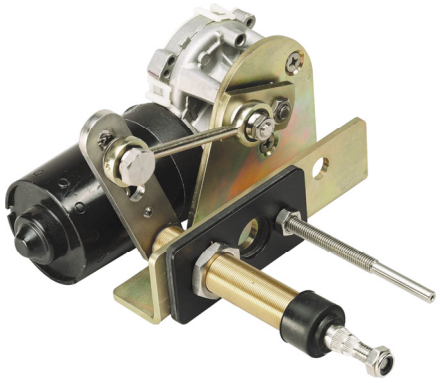
6 Troubleshooting 14

7 Declaration of conformity 15

8 Parts list 16

9 Exploded Views 17
9.1 Assembly overview 17
9.2 Internal wiring diagram 18

1 Introduction



With this user manual we want to guide you in the installation and use of the Exalto windshield wiper. Follow all instructions and install all safety provisions.

1.1 Introduction

The Exalto windshield wipers are especially designed to keep working even with the most extreme weather conditions at sea. All external parts are made of corrosion resistant materials. The housing of the self-lubricating bearings is made of bronze. All arms and blades have a black, weather-resistant coating, to prevent reflection.

!

Wiper type 223 BS is designed to be mounted in the bulkhead. The wiper arc is adjustable from 40° to 90°. Standard the 223 BS can be supplied for bulkhead thickness of 20 and 55 mm. The pantograph arms are adjustable in length in order to set the wipe area accurately. Both the 12 Volt and 24 Volt motors have IER (insulated earth return).

1.2 Environmental factors

In the wiper, materials are used that are harmful for the environment (e.g. copper). The parts of the wiper can be re-used or recycled. No harmful substances are disseminated when using or disassembling the wiper.

1.3 Modified use and guarantee conditions

All modifications or defects in the product are subject to the Orgalime General Conditions of Sale. Please contact your vendor in case of any questions or if you want to use Exalto wipers in a non-maritime environment or other applications.

2 Technical data

2.1 General

- Product ..... Exalto windshield wiper
- Types ..... 223 BS – 12 Volt and 24 Volt
- Cat. No. 12V 2167.30/35
- Cat. No. 24V 2168.30/35

2.2 Electrical data 12 Volt

- Torque (max.) ..... 23 Nm
- Voltage ..... 12 Volt
- Current ..... 3 A
- Power consumption (max.) ..... 36 W
- Number of revolutions ..... Low 38 rpm, high 59 rpm
- Recommended cable ..... 5 wires, 1½ (16 g) or 2½ mm^2 (14 g) ..... up to 10 m long
- Recommended fuse ..... 6 A slow blow
- Grounding ..... Insulated earth return (IER)

2.3 Electrical data 24 Volt

- Torque (max.) ..... 23 Nm
- Voltage ..... 24 Volt
- Current ..... 1.5 A
- Power consumption (max.) ..... 36 W
- Number of revolutions ..... Low 35 rpm, high 56 rpm
- Recommended cable ..... 5 wires, 1½ (16 g) or 2½ mm^2 (14 g) ..... up to 10 m long
- Recommended fuse ..... 4 A slow blow
- Grounding ..... Insulated earth return (IER)

2.4 Mechanical data

- Dimensions ..... l x w x h = 173 x 107 x 131 mm
- Bearing diameters ..... Drive shaft Ø 20 / support shaft Ø 8 mm
- Mounting ..... In bulkhead (20 or 55 mm)
- Bearing ..... Bronze housing, self-lubricating
- Wiperarms ..... Model PU up to 750 mm
- Wiperblades ..... Up to 800 mm
- Wipe arc ..... Slotted lever 40°-90° steplessly ..... adjustable
- Weight ..... approx. 2.3 kg

3 Installation

Read the chapter on safety. Check before installation if the parts are all present and undamaged. In case of errors, contact your vendor.

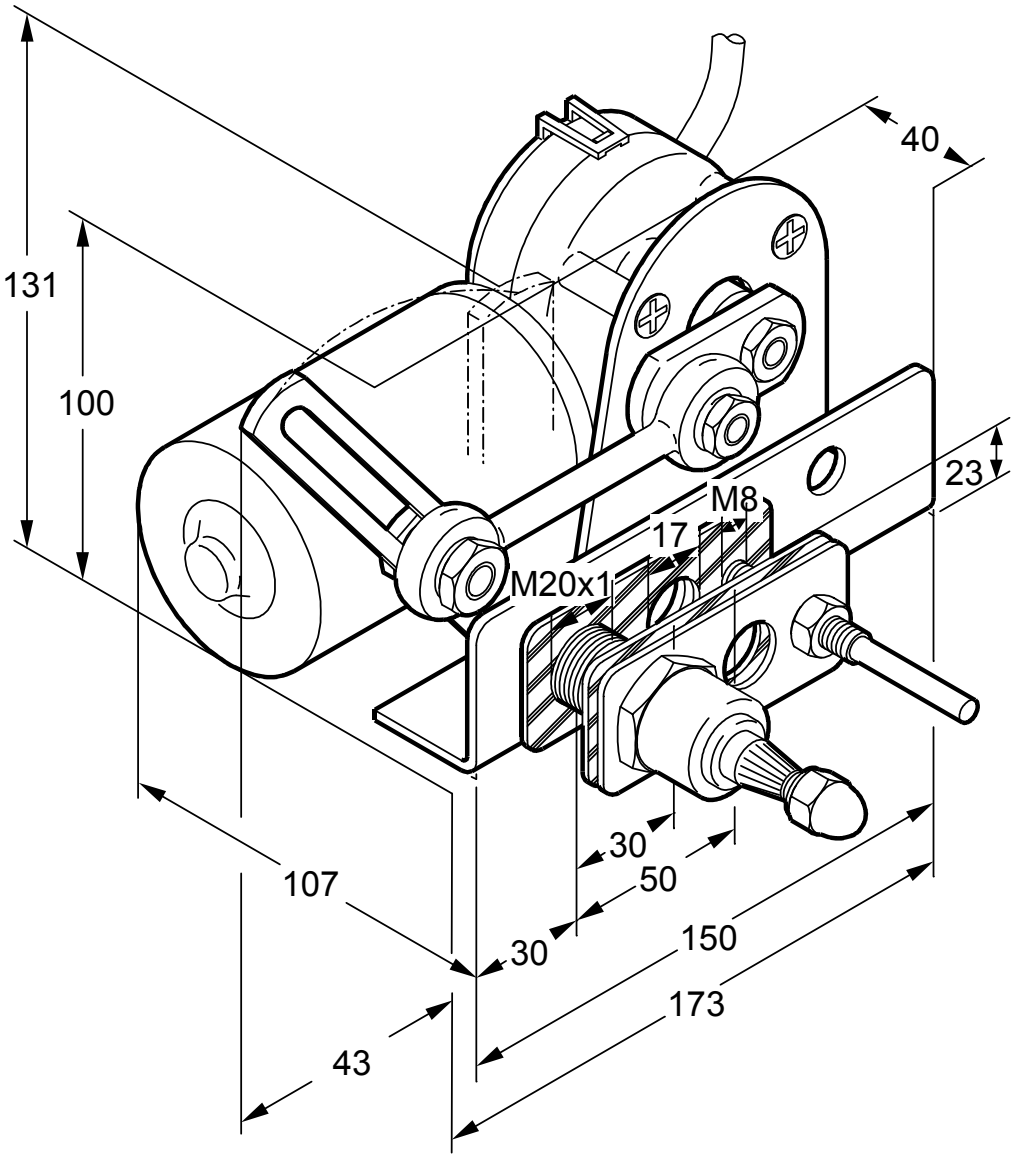
3.1 Preparation

The complete wiper, with packaging, can be handled and transported by hand. Leave the wiper in the packing, until you're ready to install it; this to reduce the risk of damage. Make sure all parts, tools and other means are ready.

3.2 Installation of mechanical parts

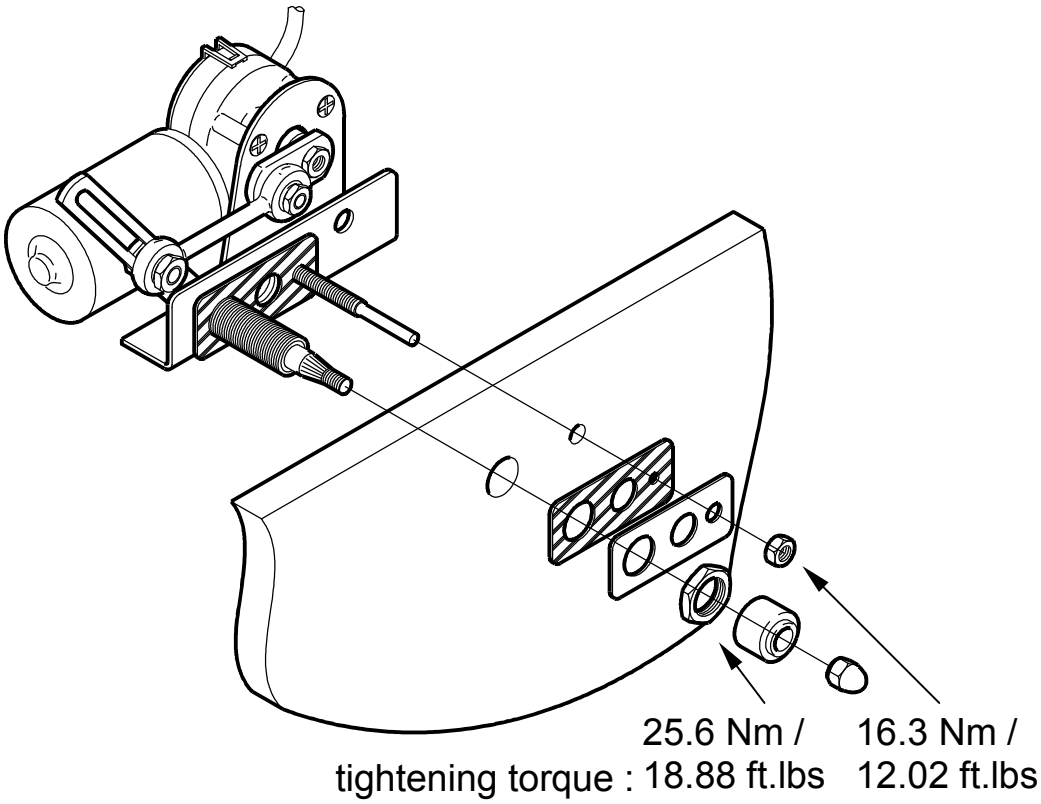
1. If your wiper is supplied with the wipe arc lever uninstalled, please follow steps 5.3 and 5.4 (pages 11-12) to set the wiping arc prior to installation.

   Determine the position where the wiper is to be installed. The dimensions are shown below. The wiper can be installed in any position.



Attention!

When installing the wiper, reserve space for a housing or cover.



2. Place the windshield wiper in the pre-drilled holes of the bulkhead (see figure). A nitrile plate must be placed at both sides of the bulkhead.

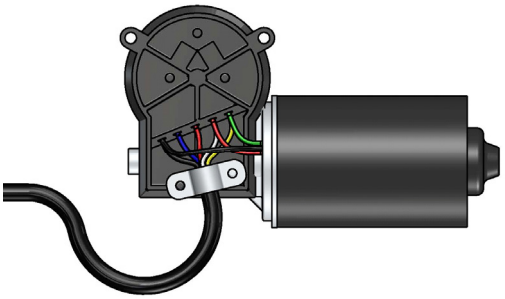
3. Make the electrical connection before fitting the wiper arm.

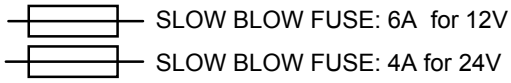
3.3 Electrical installation

4. Install a wiper switch in the dashboard.

Wiring diagram 223 BS

Colours	Function	Pol
yellow	low speed	+
black	minus/earth	-
blue	common leg	
red	selfparking	+
White	high speed	+





5. Connect the wiper to the ship's electrical installation; see the diagram above. Use a 5 lead cable with a diameter of at least 1½ mm^2 (16 g) each, for cable lengths of max. 10 m. For longer cables, increase the diameter.

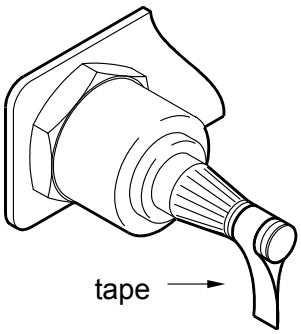
6. Place a slow blow fuse of 6 A (12 Volt) resp. 4 A (24 Volt) in the power supply.

7. Connect the switch to the wiper (refer to that specific manual for installation).

3.4 Final installation

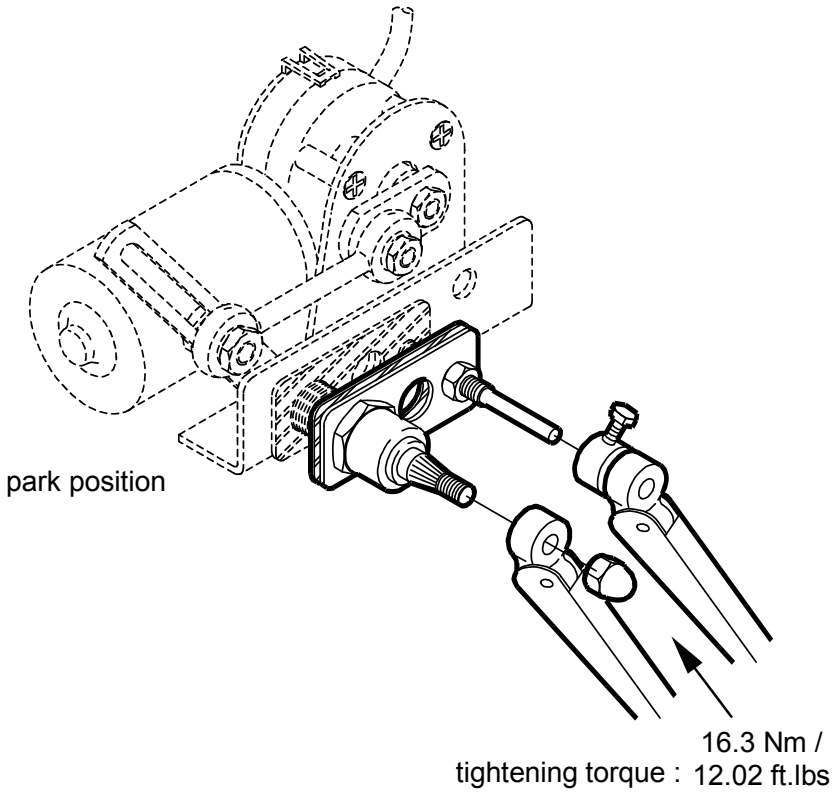
8. Testrun the motor briefly. Wait until the motor stops after turning the switch off. If the wiper is well installed, the motor will be in park position. The standard park position is shown in the figure under point 9.

   Hint!
   If you have doubts regarding the park position, make a vane with tape to simulate the position of the arms.

   Attention!
   The 223 BS is suitable for wiper arms model PU up to 750 mm and matching blades up to 800 mm.

9. Place the wiper arms with the blade on the shafts. Fasten the nuts onto the shafts, but not too tight yet.



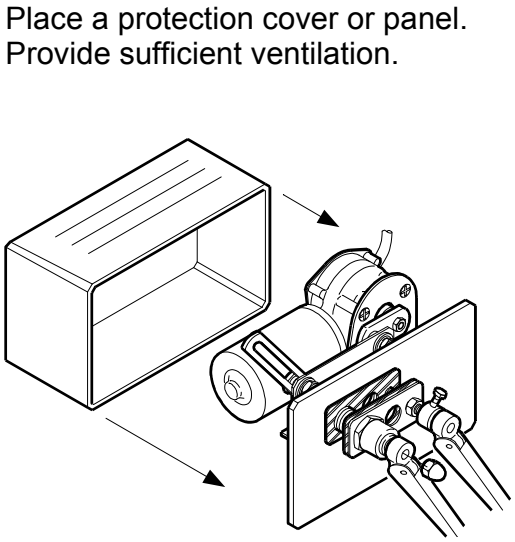
10. Switch on the power and test the motor briefly again to check the wiped area.

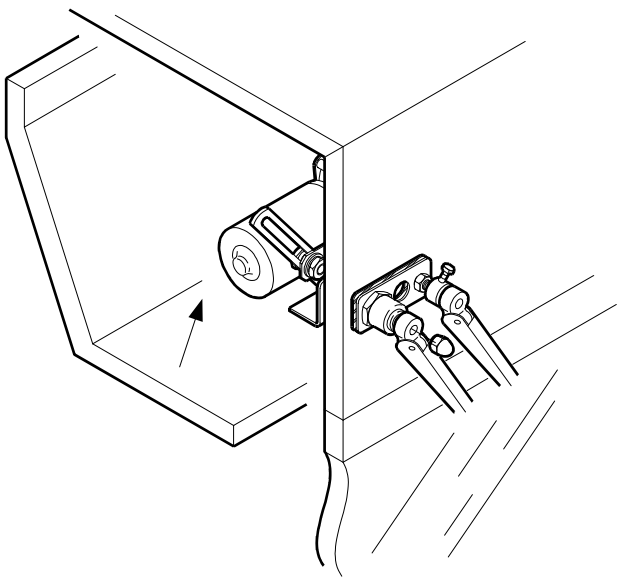
11. If the wipe arc is correct, adjust the position and the length of the arm if necessary. Tighten the nuts properly now.

12. To complete the installation, the wiper must be enclosed by means of a panel or cover. Make sure to provide the wiper motor with sufficient ventilation.

!

Place a protection cover or panel.
Provide sufficient ventilation.





4 Operation and use

4.1 Preparation for first use

If the wiper has been installed and been adjusted, the system can be prepared for first use. We recommend a thorough inspection of the system to ensure proper operation.

Check:
… if there are no leaks where the shaft goes through the bulkhead;
… if the wipe arc cleans the entire window;
… if the park position is correct.

If the wipe arc or the park position is wrong, adjust them again. Follow the procedure in section 5.3.

4.2 Use

All Exalto windshield wipers are provided with the following functions:
- low speed;
- high speed;
- self parking.

Do not use the wiper on a dry window; excessive wear of the blades and the motor can occur in this case. Clean the wiper frequently with fresh water (see also paragraph 5.1).

Because of the big variety of wiper switches, we refer to the user manual of the installed switch to learn about the functions of that specific switch.

5 Maintenance

5.1 General maintenance

To keep the Exalto wiper in good condition, you are advised to:

- clean wiper, arms and blades with fresh water after every journey in salt water (to prevent salt from clogging moving parts);
- do not use the wiper on a dry window.

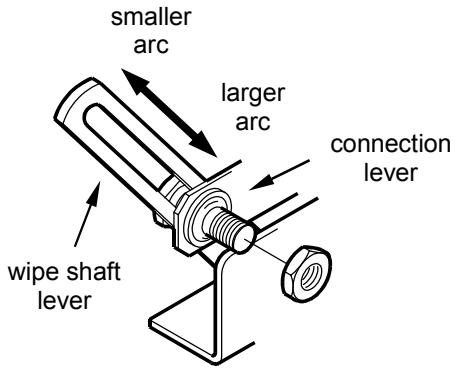
5.2 Servicing

As long as the wiper system functions normally and is kept in good shape (see section 5.1), servicing the motor is not necessary. Check yearly (monthly when used intensively) if the wiper blades are worn. Replace blades when worn or when the blades leave many stripes across the glass. In case of failure or adjustments, have servicing done solely by qualified mechanics. In chapter 6, "Troubleshooting", a listing is given of possible problems and their solutions.

5.3 Changing the wipe arc and park position

If the wiped area is too small or too large, the wipe arc and park position can be changed. Always disconnect the power supply before opening the housing.

Adjusting the wipe arc

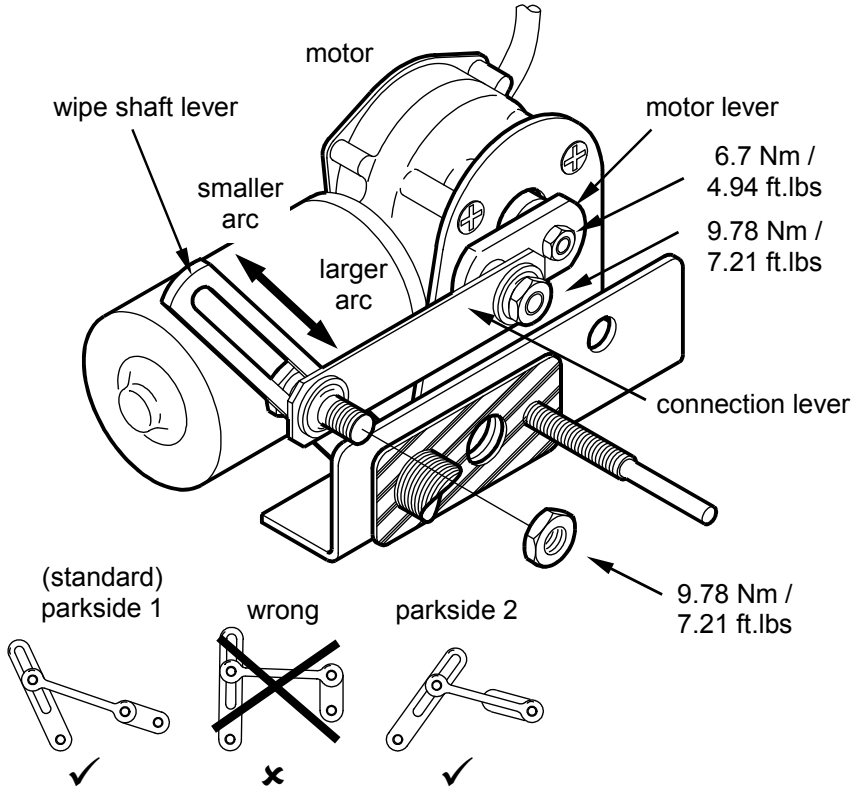


- disconnect the power supply;
- remove the wiper from the bulkhead;
- loosen the nut of the wipe shaft lever (see figure on the right);
- move the screw away from the shaft for a smaller wiper arc or towards the shaft for a larger wipe arc;
- fasten the nut again (max. 9.78 Nm / 7.21 ft.lbs);
- run the motor briefly to park it;
- fix the motor lever in the desired park position (see the text below).

Adjusting the park position

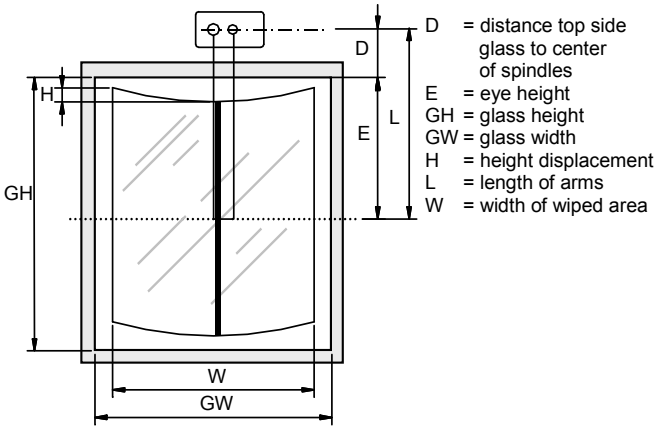
- Place the motor lever loosely on the shaft, parking right or left (see the drawing in paragraph 3.4 and below for reference);
- place the motor lever in such a way that it forms an almost straight line with the connection lever (see the drawing below);
- tighten the motor lever well now;
- place the wiper in the bulkhead;

- adjust the wiper arm to the correct length, if necessary.

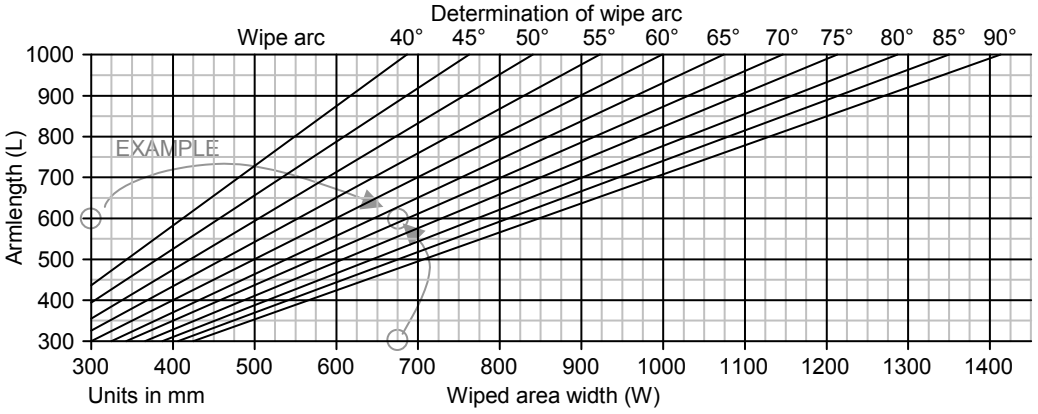


5.4 Rough determination of wipe arc and wiper blade

With this method the wipe arc and the wiper blade length can roughly be determined. Please contact your vendor to calculate your configuration more accurately



- Determine length of panto-graph arm (L): ***L = E + D***
- get the maximum wiped area width (W): ***W = ±0.9 * GW***
- find the intersection of L en W in the diagram below;
- the wipe arc-line closest to the intersection, shows the wipe arc;



- find in the table below the vertical displacement of the blade (H);

Determining the vertical displacement of the wiper blade

Armlength (L)		300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
Wipe arc	40°	19	21	25	26	30	34	37	40	43	45	48	51	54	57	60
	45°	23	27	30	35	38	42	46	50	53	57	61	65	68	72	76
	50°	26	33	36	43	47	52	56	61	66	70	75	80	84	89	94
	55°	34	40	45	51	57	62	66	74	79	85	90	96	102	107	113
	60°	40	47	54	60	67	74	80	87	94	100	107	114	121	127	134
	65°	47	55	63	71	79	86	94	102	110	117	125	133	141	149	157
	70°	55	63	73	81	90	100	109	118	127	136	145	154	163	172	181
	75°	62	73	83	93	104	114	124	135	145	155	165	176	186	196	207
	80°	70	82	94	105	117	129	140	152	164	175	187	199	211	222	234
	85°	79	92	105	119	132	145	158	171	184	197	210	223	236	250	263
	90°	86	103	117	132	146	161	176	190	205	220	234	249	264	278	293

Units in mm Vertical displacement of the blade (H)

- Now the wiper blade can be calculated:
  Length of wiper blade = 0.9 * 2 * (E - H)

5.5 Disassembly and assembly

! Prevent injuries when disassembling: disconnect the wiper from the power supply. Keep all necessary tools within reach and remember the chapter on safety. Provide well protected packaging, if you're going to stock or transport the wiper assembly.

5.5.1 Removing the wiper assembly from the bulkhead

1. Disconnect all the electric connections of the wiper.
2. Remove the wiper arms.
3. Remove the nuts (20, 13, 22) and plates (17, 18) on the outside.
4. Remove the wiper out of the holes in the bulkhead.
5. If you want to replace the wiper, follow chapter 3.

5.5.2 Removing the motor from the wiper assembly

1. Disconnect all the electric connections of the wiper.
2. Disassemble the motor lever (5) (see 5.5.2).
3. Unscrew the motor and remove it.
4. When replacing, screw the motor on the housing. Follow section 5.3 to install the wipe arc disc in the correct park position.

6 Troubleshooting

In this chapter, several malfunctions are mentioned combined with possible causes. Please leave servicing to qualified mechanics.

6.1 Wiper does not work after switching on

- Possible causes:
  1. Wiper switch is not working properly.
  2. Burned or incorrectly sized fuse.
  3. Electrical connections are wired incorrectly or might be damaged.
  4. The wiper motor has failed.
- Solutions:
  1. Test and replace it. Check if the current is (and keeps being) too high.
  2. (See solution 1).
  3. Measure the voltage across the motor and check all connections if there is none.
  4. Replace the motor and check for drag or a high current.

6.2 Wiped area or park position is not correct

- Possible causes:
  1. The wiper arms were placed without parking the motor first.
  2. The wipe arc is set wrong or changed due to high loads (e.g. spring pressure of arms too high, drag).
  3. The wires are connected incorrectly.
- Solutions:
  1. Remove the wiper arms. Run the motor shortly to park it and re-install the arms according to chapter 3.
  2. Determine the wipe arc if needed (see section 5.4) and set the wipe arc again (see chapter 5.3).
  3. Check and reconnect the wiring (see the scheme in section 3.3).

6.3 Motor runs, but arms do not move

- Possible causes:
  1. Mechanical joints are loose.
  2. Parts are broken.
  3. Grooves of shafts are worn.
- Solutions:
  1. Check if the arms are well fastened. If not, open the housing (follow chapter 5) and check all joints and parts to see if they are loose, broken or worn.

7 Declaration of conformity

MANUFACTURER'S DECLARATION

In accordance to Appendix II sub B of Directive 89/392/EEG (Machines)

Exalto B.V.
Nijverheidsstraat 12
3371 XE Hardinxveld-Giessendam
The Netherlands
☎ +31 (0)184-61.58.00
Fax: +31 (0)184-61.40.45

hereby declares that

Exalto windshield wiper type 223 BS

… is intended to be built into another machine or as a component, or is to be integrated with other machines to a machine where Directive 89/392/EEG applies to;

… **does not** fully comply to the requirements of mentioned Directive;

… complies to the following harmonised standards:

Pleasure yachts

- NEN-EN-ISO 10133 Extra-low voltage D.C. installations (1997) (regarding color codes)

…and declares that the sub-assembly in question shall not be set into operation until the complete machine, into which the sub-assembly is fitted, shall be complete and conforms to all aspects of Directive 89/392/EEG.

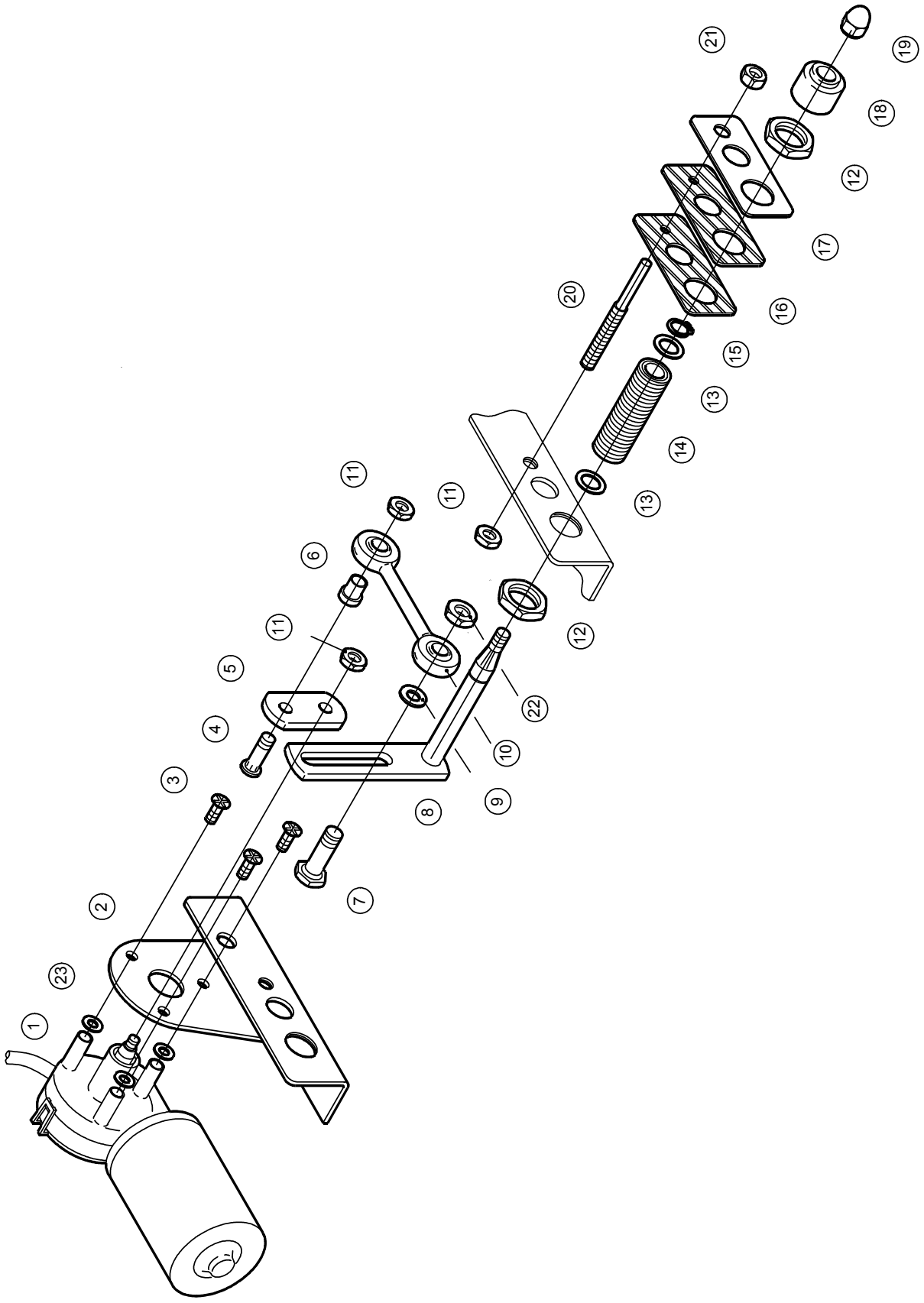
Hardinxveld-Giessendam
07-04-2012 (m-d-y)

8 Parts list

Pos	Qty	Description	Dimensions	Cat. No.
1	1	Motor 12 V 23 Nm	180x105x85	2100.2312
		Motor 24 V 23 Nm	180x105x85	2100.2324
2	1	Wiper housing	150x90x40	2100.104
3	3	Socket screw s.s. countersunk (DIN 965)	M6x16	2100.050
4	1	Lever pin 8 mm	M8x26	2100.920
5	1	Motor lever	53x25x5	2100.117
6	1	Spacer	Ø13x14	2100.925
7	1	Lever pin 10 mm	M10x28	2100.701
8	1	Drive shaft assembly for 20 mm bulkhead	Ø12x102	2100.365
	1	Drive shaft assembly for 55 mm bulkhead	Ø12x137	2100.367
9	1	Ring s.s. (DIN 125A)	M10	2100.092
10	1	Connection lever	110x24x10	2100.936
11	3	Nut s.s. flat	M8x4	2100.760
12	2	Nut s.s.	M20x1	2100.350
13	1	Ring s.s.	Ø18x12x1	2100.400
14	1	Liner assembly for 20 mm bulkhead	M20x65	2100.326
	1	Liner assembly for 55 mm bulkhead	M20x100	2100.327
15	1	Circlip	Ø12x4	2100.410
16	2	Rubber plate	90x45x3	2100.491
17	1	S.s. plate	90x45x3	2100.481
18	1	Weather cap	Ø26x20	2100.361
19	1	Nyloc nut s.s.	M8	2100.346
20	1	Idler shaft for 20 mm bulkhead	M8x70	2100.446
	1	Idler shaft for 55 mm bulkhead	M8x110	2100.447
21	1	Nut s.s.	M8	2100.460
22	3	Ring s.s. DIN 125A (24 V only)	M6	2100.690

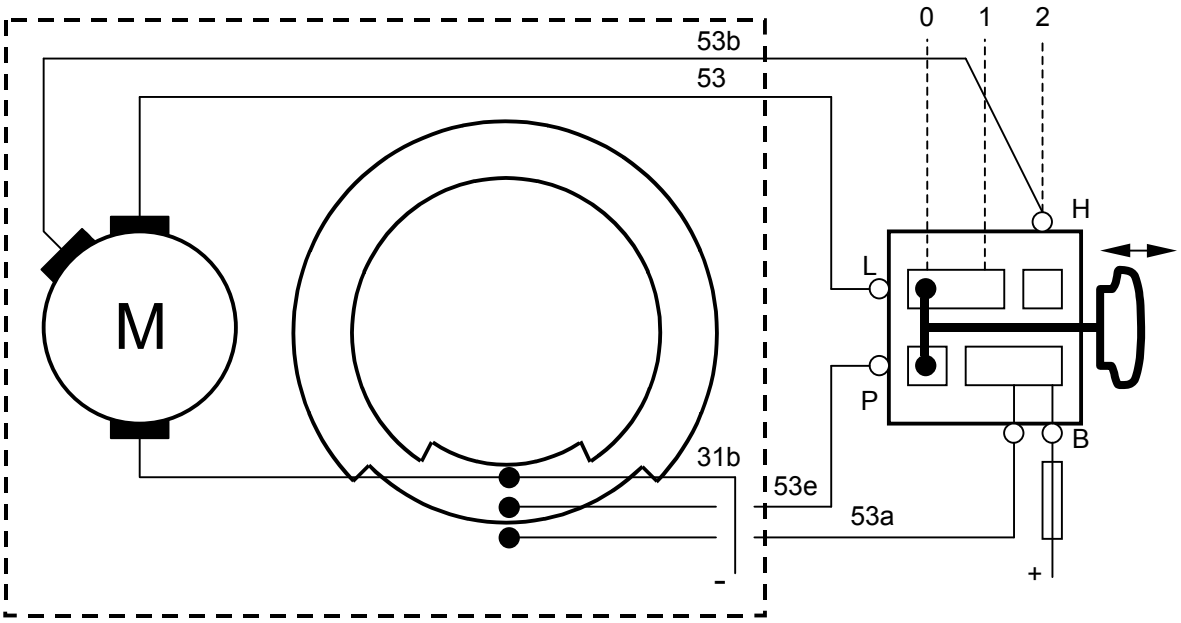
9 Exploded Views

9.1 Assembly overview



9.2 Internal wiring diagram

The following diagram is explains the way the wiper motor works.



Function	Polarity	Motor code	Switch code	Cable 12/24V
High speed	+	53b	H	white
Low speed	+	53	L	yellow
Earth	-	31b		black
Common leg		53e	P	blue
Self-parking	+	53a	B	red

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